MASS AIR FLOW (MAF) SENSOR TESTER
KASTAR NO. 280A

Part Number 20497
Rev. A

The MAF Tester was developed to quickly determine if a Mass Air Flow Sensor is functioning or not, or operating intermittently. This Tester may be used to test Mass Air Flow Sensors either on or off the vehicle. Mass Air Flow Sensors are devices placed in the intake air stream on some vehicles to measure the mass of the air entering the engine. The output of the MAF sensor is used by the vehicle's computer to determine fuel delivery rate and spark timing. The output of the various types of MAF Sensors falls into two categories - "Frequency Generating" type and "Voltage Generating" type.

In order to test Mass Air Flow Sensors you will need in addition to this kit a digital engine analyzer or digital multimeter with OHM and voltage scales and tachometer or frequency scales. Included in this kit is a 120VAC to 12 VDC adapter (Kastar No. 296). Some MAF Sensors require a minimum of 10.5 volts to operate properly. A 9 volt battery will not provide enough voltage in these cases.

All tests require the MAF Tester to be assembled. To assemble the Test Unit, simply plug the shrouded 3-pin male end of the Tester Lead Wire Component into the 3-pin female end of the Tester LED Component and attach the 120VAC to 12 VDC adapter to the Assembled Test Unit's battery plug. Always disconnect the Assembled Test Unit from the 120VAC to 12 VDC adapter prior to storage of the MAF Sensor Tester. The Tester LED Component and the Tester Lead Wire Component can remain connected in storage.

NOTE: Prior to hooking up the MAF Tester lead wires make sure all terminals are clean and corrosion free to assure good circuit contacts. Always repeat each test several times to verify the test results.

3-PIN "BOSCH HOT WIRE" TYPE MAF SENSOR (FREQUENCY GENERATING TYPE)

This test assures that the MAF Sensor is functioning and is capable of sensing changes in air flow.

TEST PROCEDURE

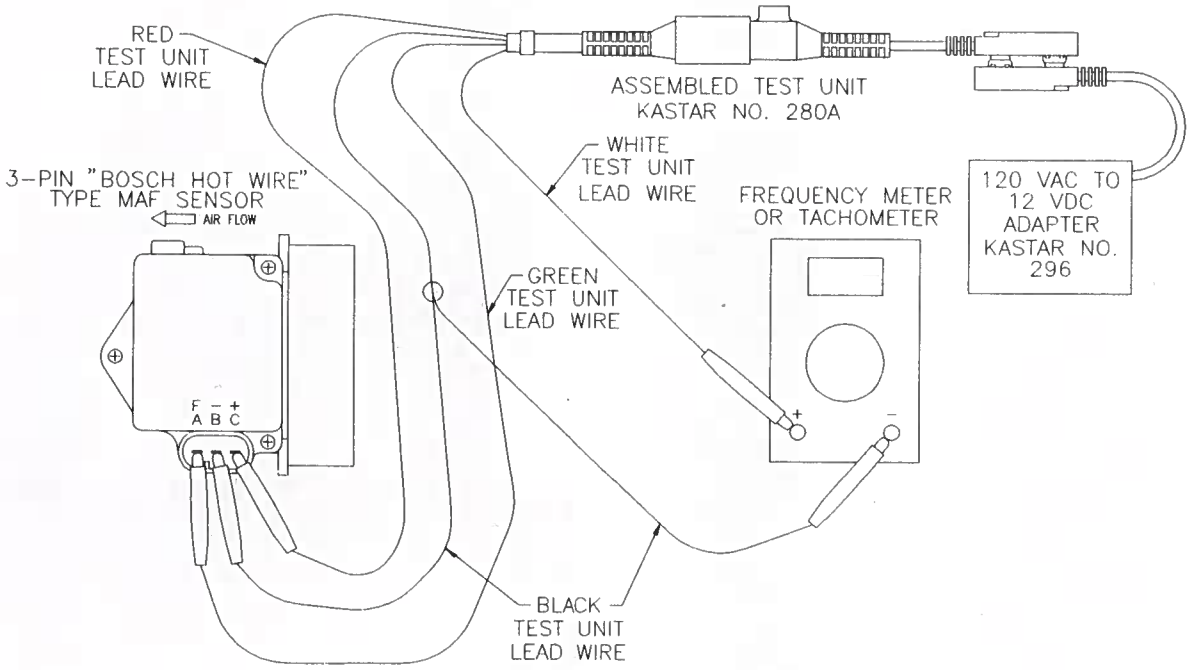
1. Connect the Assembled Test Unit to the MAF Sensor as follows. (Refer to the diagram below.)

TESTER LEADS	MAF SENSOR PINS
RED	"+" (Positive)
ONE BLACK	"-" (Negative)
GREEN	"F" (Signal)

2. Connect the remaining Assembled Test Unit leads to the digital multimeter (set to "frequency" scale) or to the digital engine analyzer (set to 8 cyl. "high" tachometer scale) as follows. (Refer to the diagram below.)

TESTER LEADS	METER INPUTS
REMAINING BLACK	"-" (Negative)
WHITE	"+" (Positive)

3-PIN "BOSCH HOT WIRE" TYPE HOOK-UP DIAGRAM


RED TEST UNIT LEAD WIRE
ASSEMBLED TEST UNIT KASTAR NO. 280A
WHITE TEST UNIT LEAD WIRE
3-PIN "BOSCH HOT WIRE" TYPE MAF SENSOR
AIR FLOW
FREQUENCY METER OR TACHOMETER
120 VAC TO 12 VDC ADAPTER KASTAR NO. 296
GREEN TEST UNIT LEAD WIRE
F - +
A B C
BLACK TEST UNIT LEAD WIRE

3. Lightly tap the housing of the sensor with a screwdriver handle or similar device. Watch the meter display while you tap the sensor. There should be no significant variation in the meter reading while performing this test. If the reading on the meter changes erratically, the sensor is defective and should be replaced.

4. If the MAF Sensor successfully passes Step 3, then blow in the direction indicated in the diagram above through the throat of the sensor. The meter reading should change value as you blow through the sensor. When you stop blowing through the throat of the sensor, the meter should return to the original reading. If there is no change in the meter reading when you blow through the sensor, or if the meter does not return to it's original reading when you stop blowing through the sensor, the MAF Sensor is defective and should be replaced.

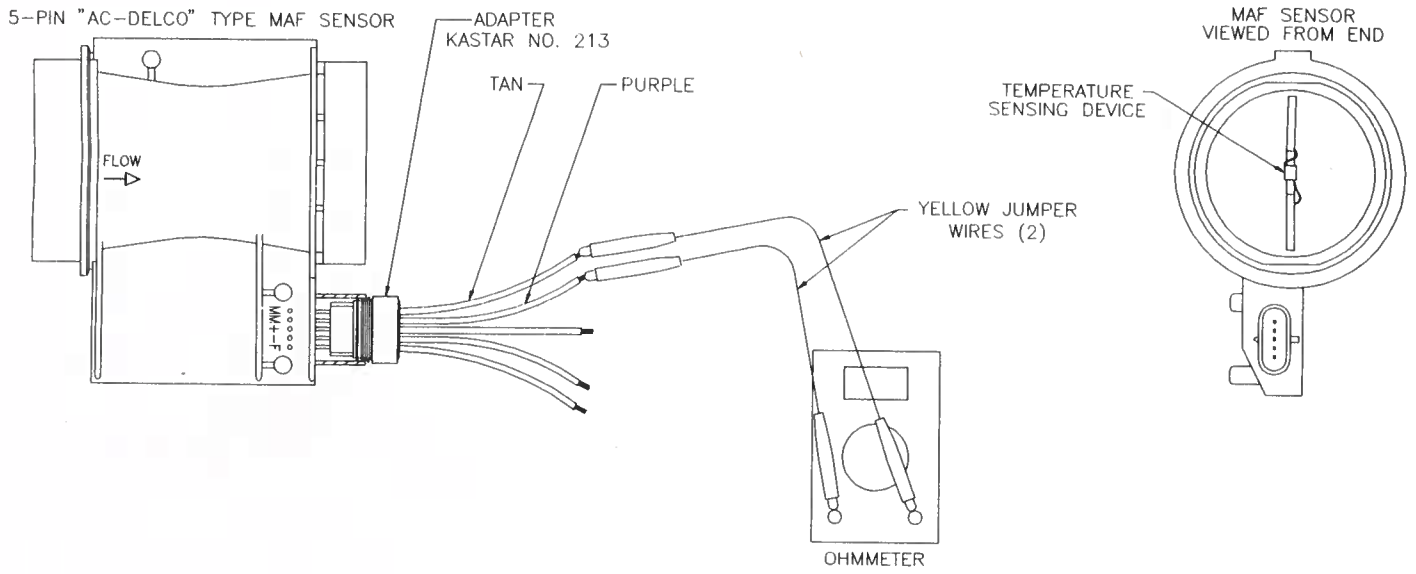
TEST NO. 2
This test assures that the temperature sensing device located in the throat of this style MAF Sensor is functioning.

TEST PROCEDURE
1. Connect the leads from the digital multimeter or digital engine analyzer (set to "OHMS" scale, "mid" range) to the MAF Sensor terminals (2) marked "M".

NOTE: The adapter used in test No. 1 above should also be used in this test. Plug the adapter into the MAF Sensor in the same manner as described in Test No. 1.

Connect the Yellow jumper wires to the Tan and Purple leadwires exiting the end of the adapter as well as to the "positive" and "negative" meter inputs. (Refer to the diagram below.) Polarity is not important.

5-PIN "AC-DELCO" TYPE HOOK-UP DIAGRAM



2. Note the initial reading on the meter display. Gently place your thumb and forefinger on the top and bottom of the temperature sensing device. The meter reading should change when you place your fingers on the device and return to the initial reading when you remove your fingers from the device. If no change occurs, the MAF Sensor is defective and should be replaced.

5-PIN "AC-DELCO" TYPE MAF SENSOR (FREQUENCY GENERATING TYPE)

TEST NO. 1
This test assures that the MAF Sensor is functioning and capable of sensing changes in air flow.

TEST PROCEDURE
1. Connect the Assembled Test Unit to the MAF Sensor as follows.

NOTE: An adapter has been included with this kit for use when testing the 5-pin "AC-DELCO" type MAF Sensor. Simply plug the adapter into the MAF Sensor so that it engages the "M", "M", "+", "-", and "F" pins. The adapter will only fit one way into the MAF Sensor.

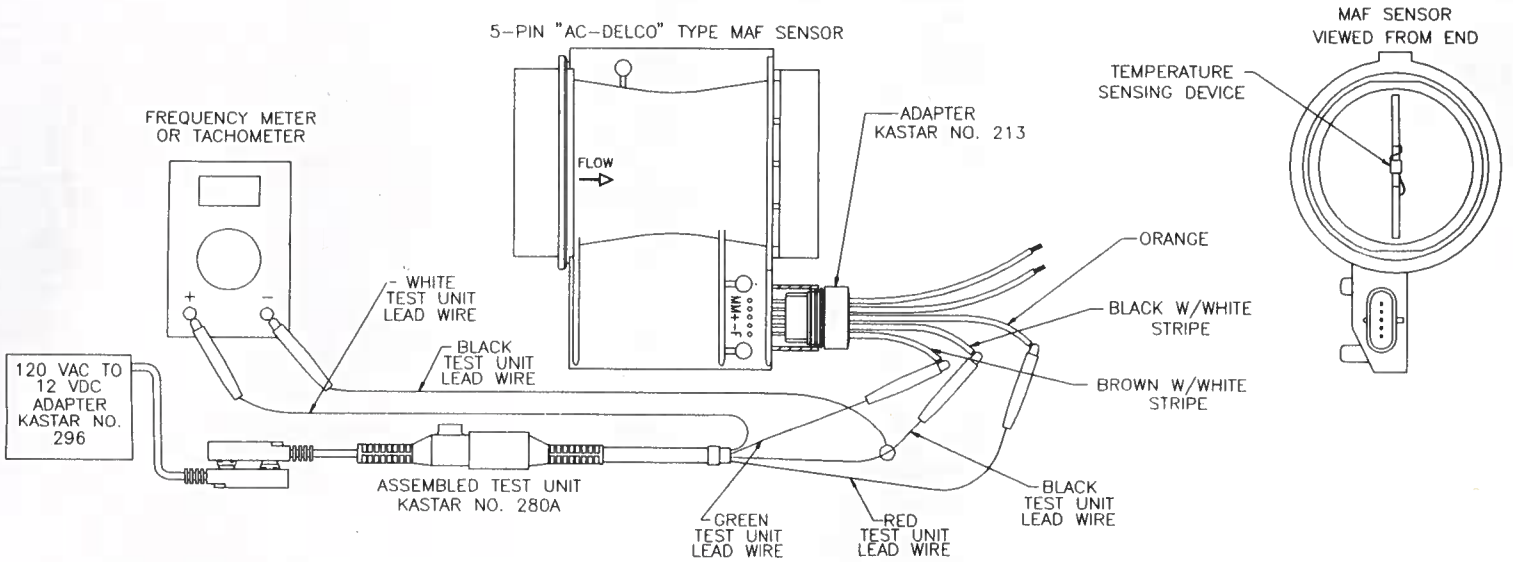
Connect the Tester Leads to the appropriate leadwires exiting the end of the adapter. (Refer the the diagram below.)

TESTER LEADS	ADAPTER LEADWIRES/MAF SENSOR PINS
RED	ORANGE ("+" Positive)
ONE BLACK	BLACK w/WHITE STRIP ("-" Negative)
GREEN	BROWN w/WHITE STRIPE ("F" Signal)

2. Connect the remaining Assembled Test Unit leads to the digital multimeter (set to "frequency" scale) or to the digital engine analyzer (set to 8 cyl. "high" tachometer scale) as follows. (Refer to the diagram below.)

TESTER LEADS	METER INPUTS
REMAINING BLACK	"-" (Negative)
WHITE	"+" (Positive)

5-PIN "AC-DELCO" TYPE HOOK-UP DIAGRAM


5-PIN "AC-DELCO" TYPE MAF SENSOR
MAF SENSOR VIEWED FROM END
TEMPERATURE SENSING DEVICE
FREQUENCY METER OR TACHOMETER
ADAPTER KASTAR NO. 213
FLOW
ORANGE
BLACK W/WHITE STRIPE
BROWN W/WHITE STRIPE
WHITE TEST UNIT LEAD WIRE
BLACK TEST UNIT LEAD WIRE
120 VAC TO 12 VDC ADAPTER KASTAR NO. 296
ASSEMBLED TEST UNIT KASTAR NO. 280A
GREEN TEST UNIT LEAD WIRE
RED TEST UNIT LEAD WIRE
BLACK TEST UNIT LEAD WIRE

3. The meter displayed should be indicating a "frequency" or "RPM". The number being displayed on the meter should be a steady reading (a slight variation up or down in the reading is acceptable.) If the output of the sensor is changing erratically up and down, the sensor is defective and should be replaced.

4. If the MAF Sensor has a steady output ad indicated in Step 3., then lightly tap the housing of the sensor with a screwdriver handle or similar device. Watch the meter display while you tap the sensor. There should be no significant variation in the meter reading while performing this test. If the reading on the meter changes erratically, the sensor is defective and should be replaced.

5. If the MAF Sensor successfully passes Steps 3 and 4, then blow in the direction indicated on the housing through the throat of the sensor. The meter reading should change value as you blow through the sensor. When you stop blowing through the throat of the sensor, the meter should return to the original reading. If there is no change in the meter reading when you blow through the sensor, or if the meter does not return to it's original reading when you stop blowing through the sensor, the MAF Sensor is defective and should be replaced.

3-PIN "AC-DELCO" TYPE MAF SENSOR (FREQUENCY GENERATING TYPE)

This test assures that the MAF Sensor is functioning and is capable of sensing changes in air flow.

TEST PROCEDURE

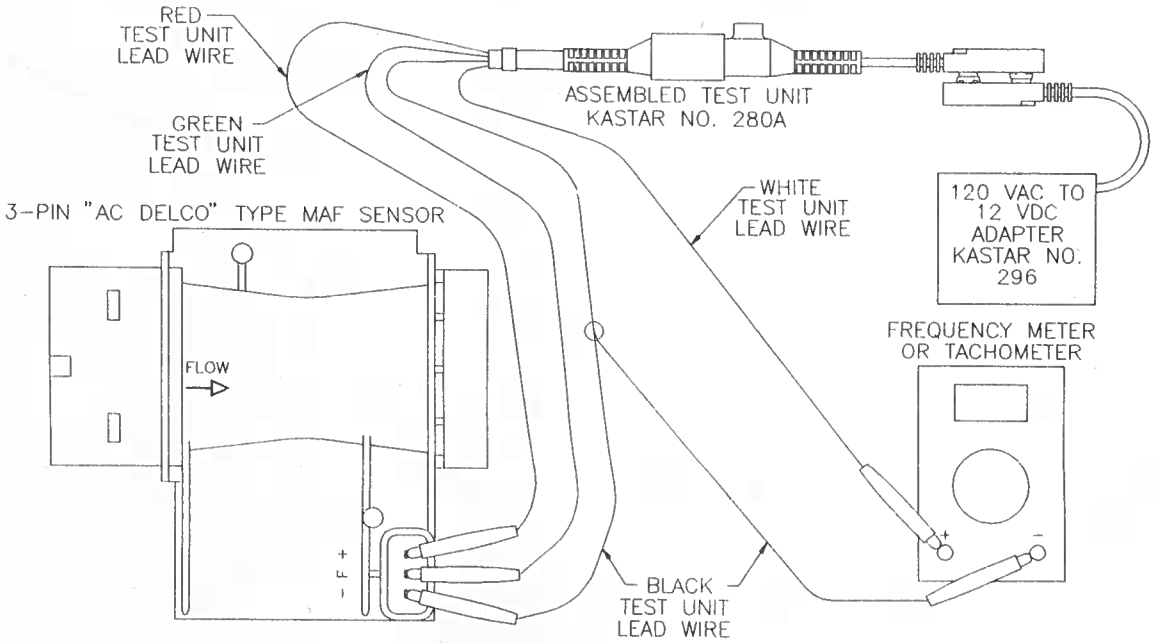
1. Connect the Assembled Test Unit to the MAF Sensor as follows. (Refer to the diagram below.)

TESTER LEADS	MAF SENSOR PINS
RED	"+" (Positive)
ONE BLACK	"-" (Negative)
GREEN	"F" (Signal)

2. Connect the remaining Assembled Test Unit leads to the digital multimeter (set to "frequency" scale) or to the digital engine analyzer (set to 8 cyl. "high" tachometer scale) as follows. (Refer to the diagram below.)

TESTER LEADS	METER INPUTS
REMAINING BLACK	"-" (Negative)
WHITE	"+" (Positive)

3-PIN "AC-DELCO" HOOK-UP DIAGRAM


RED TEST UNIT LEAD WIRE
GREEN TEST UNIT LEAD WIRE
ASSEMBLED TEST UNIT KASTAR NO. 280A
3-PIN "AC DELCO" TYPE MAF SENSOR
WHITE TEST UNIT LEAD WIRE
120 VAC TO 12 VDC ADAPTER KASTAR NO. 296
FREQUENCY METER OR TACHOMETER
FLOW
- F +
BLACK TEST UNIT LEAD WIRE

3. The meter display should be indicating a "frequency" or "RPM". The number being displayed on the meter should be a steady reading (a slight variation up or down in the reading is acceptable.) If the output of the sensor is changing erratically up and down, the sensor is defective and should be replaced.

4. If the MAF Sensor has a steady output as indicated in Step 3., then lightly tap the housing of the sensor with a screwdriver handle or similar device. Watch the meter display while you tap the sensor. There should be no significant variation in the meter reading while performing this test. If the reading on the meter changes erratically, the sensor is defective and should be replaced.

5. If the MAF Sensor successfully passes Steps 3 and 4, then blow (in the direction indicated on the sensor) through the throat of the sensor. The meter reading should change value as you blow through the sensor. When you stop blowing through the throat of the sensor, the meter should return to the original reading. If there is no change in the meter reading when you blow through the sensor, or if the meter does not return to it's original reading when you stop blowing through the sensor, the MAF Sensor is defective and should be replaced.

4-PIN FORD "HOT WIRE" TYPE MAF SENSOR (VOLTAGE GENERATING TYPE)

This test assures that the MAF Sensor is functioning and capable of sensing air flow.

TEST PROCEDURE

1. Connect the Assembled Test Unit to the MAF Sensor as follows. (Refer to the diagram below.)

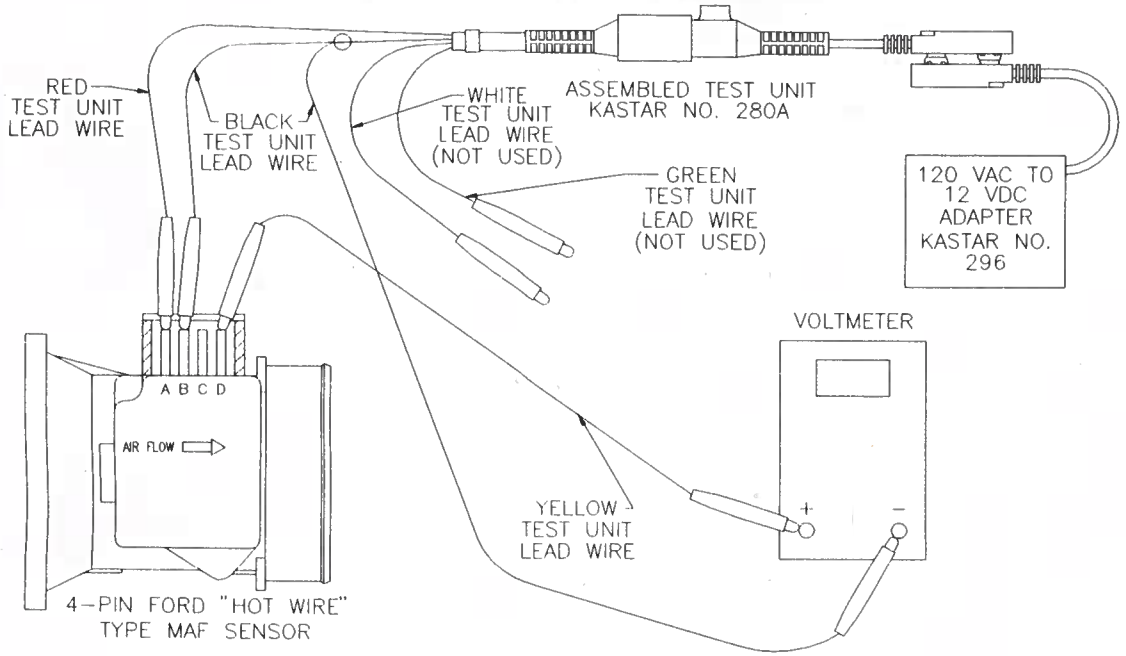
TESTER LEADS	MAF SENSOR PINS
RED	"A" (+, Positive)
ONE BLACK	"B" (-, Ground)
ONE END OF YELLOW	"D" (MAF Signal)
JUMPER WIRE	

2. Connect the following Test Unit Leads to the digital engine analyzer or digital multimeter (set to the "DC volts" scale). (Refer to the diagram below.)

TESTER LEADS	METER INPUTS
REMAINING BLACK	"-" (Negative)
OTHER END OF YELLOW	"+" (Positive)
JUMPER WIRE	

NOTE: The White and Green Test Unit Leads are not used during this test. Care should be taken so that they do not contact any ground or voltage source.

4-PIN FORD "HOT WIRE" TYPE HOOK-UP DIAGRAM


RED TEST UNIT LEAD WIRE
BLACK TEST UNIT LEAD WIRE
WHITE TEST UNIT LEAD WIRE (NOT USED)
ASSEMBLED TEST UNIT KASTAR NO. 280A
GREEN TEST UNIT LEAD WIRE (NOT USED)
120 VAC TO 12 VDC ADAPTER KASTAR NO. 296
VOLTMETER
A B C D
AIR FLOW
YELLOW TEST UNIT LEAD WIRE
+
-
4-PIN FORD "HOT WIRE" TYPE MAF SENSOR

3. The initial reading on the meter should not exceed 0.70 volts. If the voltage is greater than 0.70 volts, the MAF sensor is defective and should be replaced.

4. Lightly tap the housing of the sensor with a screwdriver handle or similar device. Watch the meter display while you tap the sensor. There should be no significant variation in the meter reading while performing this test. If the reading on the meter changes erratically, the sensor is defective and should be replaced.

5. If the MAF Sensor successfully passes Steps 3 and 4, then blow in the direction indicated on the housing through the throat of the sensor The voltage displayed on the meter should increase to some higher value. When you stop blowing through the throat of the sensor, the voltage output of the sensor should return to the initial voltage displayed on the meter. If the voltage displayed on the meter does not increase and return to the initial reading during this test, the sensor is defective and should be replaced.